

(D) 0.75 to 7.5 percent by weight of behenyl alcohol, having the contained weight ratio of stearyl alcohol to behenyl alcohol at 1:1.5 to 1: 4.5.

DETAILED DESCRIPTION OF THE INVENTION

FIELD OF THE INVENTION

The present invention relates to a shampoo composition, that has pearl-state crystal, and whose appearance is glossy, and that excels in storage stability and hair-conditioning effects.

RELATED ART

For the purpose of enhancing commercial values of shampoo, conditioner and lotion, their appearance is made pearl-like in appearance.

As so-called pearl luster agents, crystals, such as argentine, mica, higher fatty acids or their salts, or ethyleneglycol higher fatty acid esters, have conventionally been used.

Among them, the widely-used pearl luster agents these days are ester crystals of polyalcohols, such as ethyleneglycol, and higher fatty acids, as described in a publication, such as Japanese Patent Application Laid-Open No. S57-156409. However, these have defects where they require a complicated process, such as to prepare an ethyleneglycol higher fatty acid ester in advance and to dispense it into a composition, and where if a large quantity of the pearl luster agent is dispensed into a shampoo composition in order to add glossy pearl luster, hair-conditioning effects mentioned below (suppleness of hair, easiness to arrange hair, smoothness of hair and easiness to comb hair) are diminished.

DISCLOSURE OF THE INVENTION

As a result of a keen study for the purpose of obtaining a shampoo composition where pearl luster whose appearance is glossy, and that excels in the storage stability is added; concurrently, that excels in the hair-conditioning effects, the present inventor has discovered that a shampoo composition containing a specific amount of a specific amphoteric surfactant, polypeptide, stearyl alcohol and behenyl alcohol as essential components, respectively, can accomplish the aforementioned objectives, and completed the present invention.

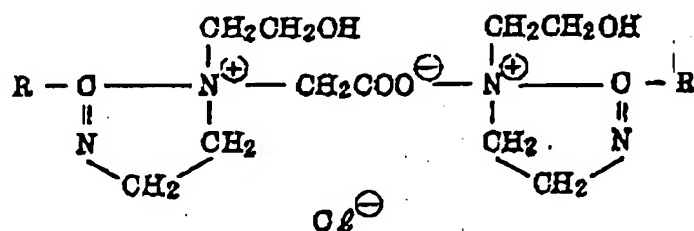
OBJECTIVE OF THE INVENTION

In the other words, the objective of the present invention is to provide a shampoo composition excelling in pearl glossiness, storage stability and hair-conditioning effects.

CONSTRUCTION OF THE INVENTION

The present invention is a shampoo composition containing an anionic surfactant and/or an amphoteric surfactant as a substrate, containing

- (A) 1.0 to 6 percent by weight of at least one type of bis (2-alkyl-N-hydroxyethyl imidazoline) chloroacetic acid complex type amphoteric surfactants represented by the following general formula:



wherein R represents a long-chain alkyl group with 11 to 21 of carbon number;

- (B) 1.0 to 12 percent by weight of polypeptide with 200 to 5,000 of average molecular weight;
 (C) 0.5 to 5 percent by weight of stearyl alcohol; and
 (D) 0.75 to 7.5 percent by weight of behenyl alcohol, having the contained weight ratio of stearyl alcohol to behenyl alcohol at 1:1.5 to 1: 4.5.

(Specific Description of the Construction)

As the anion surfactants and the amphoteric surfactants to be used for the shampoo substrate of the present invention, the following are illustrated with examples:

(I) Anionic surfactants

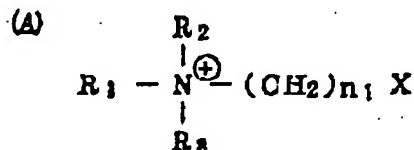
- (1) Alkyl or alkenyl ether sulfate having a straight-chain or branched-chain alkyl group or alkenyl group with 8 to 20 of average carbon number and adding 0.5 to 8 moles of ethylene oxide in average into one molecule;
- (2) Alkyl or alkenyl ether sulfate having an alkyl group or an alkenyl group with 10 to 20 of average carbon number; and
- (3) Olefin sulfonate comprising an alkyl group with 10 to 20 of average carbon number.

As a counter ion of the anionic surfactant, an alkali metal ion, such as sodium or potassium, and cation to be induced from ammonium ion or triethanol amine can be included.

(II) Ampoteric surfactants

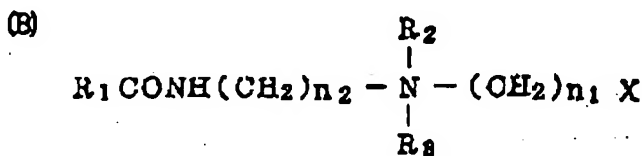
- (1) Alkyl betaine or sulfo betaine (A) and amide betaine or amidesulfo betaine (B) represented by the following formula:

(A)



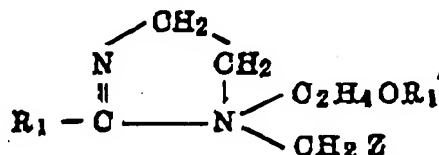
wherein R_1 represents an alkyl group or an alkenyl group with 10 to 22 of carbon number, R_2 and R_3 represent an alkyl group with 1 to 4 of carbon number, respectively, n_1 represents 1 to 3 of integer, and X represents $-COO^-$ group or $-SO_3^-$ group;

(B)

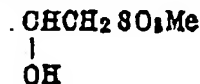


wherein R_1 represents an alkyl group or an alkenyl group with 11 to 21 of carbon number, R_2 and R_3 represent an alkyl group with 1 to 4 of carbon number, respectively, n_1 represents 1 to 3 of integer, n_2 represents 1 to 4 of integer, and X represents $-COO^-$ group or $-SO_3^-$ group; and

- (2) Imidazoline ampoteric surfactants represented by the following formula:



wherein R_1 represents a fatty acid salt with 11 to 21 of average carbon number; R_1' represents H, Na or CH_2COOMe ; Z represent $COOMe$, CH_2COOMe or $CHCH_2SO_3Me$ and Me represents Na, H or organic base.



As described above, the especially preferable shampoo substrates among them are anionic surfactants, such as straight-chain alkyl sulfate with 10 to 14 of average carbon number or polyoxyethylene sulfate

Further, the average molecular weight of polypeptide (measurement by gel filtration) is 200 to 5,000, and preferably 400 to 3,000. If the average molecular weight is less than 200 or exceeds 5,000, excellent pearl luster and hair-conditioning effects cannot be obtained.

Further, the content of polypeptide is 1.0 to 12 percent by weight, preferably 2.0 to 10 percent by weight. If the content is less than 1 part by weight or exceeds 12 percent by weight, the excellent pearl luster cannot be obtained, and the storage stability mentioned below is deteriorated.

Further, [the content of] stearyl alcohol, which is the component (C), is 0.5 to 5 percent by weight, preferably 0.5 to 3 percent by weight. [The content of] behenyl alcohol, which is the component (D), is 0.75 to 7.5 percent by weight, preferably 0.75 to 4 percent by weight, and the compounding weight ratio of stearyl alcohol to behenyl alcohol is within the range of 1:1.5 to 1:4.5, most preferably 1:2 to 1:4. If the compounding weight ratio of stearyl alcohol to behenyl alcohol is out of the aforementioned range, the excellent pearl luster and storage stability cannot be obtained.

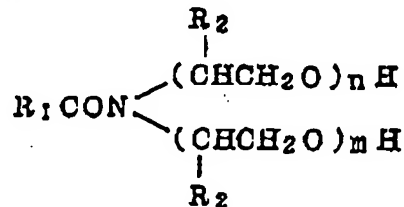
In the shampoo composition of the present invention, the four components: (A) to (D) are essential to the aforementioned shampoo substrate. However, other components can be dispensed within the scope to accomplish the objective of the present invention.

Among them, it is preferable to simultaneously use a nonionic surfactant mentioned below.

(1) $\text{RO}(\text{CH}_2\text{CH}_2\text{O})_n\text{H}$

R represents a primary or secondary alkyl group or alkenyl group with 8 to 20 of average carbon number, and n represents 8 to 12 of integer.

(2) Higher fatty acid alkanolamide represented by the following formula:



wherein R₁ represents an alkyl group or an alkenyl group with 11 to 21 of carbon number; R₂ represents H or CH₃; n represents 1 to 3 of integer, and m represents 0 to 3 of integer. Especially, higher fatty acid mono- or di-alkanolamide is preferable.

Other than those, a moisturizing agent, such as propylene glycol, glycerin or polyethylene glycol; a cellulose derivative, such as methyl cellulose, hydroxyethyl cellulose or cationized cellulose; an oil-based component, such as camellia oil, avocado oil or lanolin derivative; pesticide; a dandruff agent; a chelator; an antiseptic agent; a pH adjustor; an ultraviolet absorber; antioxidant; a coloring agent and fragrance are included, and one or more types of these can be contained.

Although the reason why the pearl luster is added to the shampoo composition of the present invention is not clear, it is assumed that this is because complex salt of bis (2-alkyl-N-hydroxyethyl imidazoline) chloroacetic acid complex type amphoteric surfactant, a specific compounding ratio of stearyl alcohol to behenyl alcohol and polypeptide is precipitated.

EXAMPLES

Next, the present invention is described with examples. However, the present invention is not limited to these examples. Furthermore, a test method used in the present examples is as follows:

(1) Pearl luster

Samples were placed in a 100 ml clear glass container, respectively, and they were evaluated based upon the following standards with the naked eyes:

○: Glossy pearl luster is perceived.

△: Pearl luster is slightly perceived.

×: No pearl luster is perceived.

(2) Storage stability

(a) Stability at high temperature

Samples were placed in a 100 ml clear glass container, respectively, and after storing in a temperature-controlled room at 45 °C for 1 month, they were evaluated based upon the following standards with the naked eyes:

○: No phase separation, aggregation and disappearance of pearl luster are perceived.

×: Phase separation, aggregation and disappearance of pearl luster are perceived.

(a) Stability at low temperature

Samples were placed in a 100 ml clear glass container, respectively, and after storing in a temperature-controlled room at 0 °C for 1 month, they were evaluated based upon the following standards with the naked eyes:

○: No phase separation and agglomeration are perceived.

×: Phase separation and agglomeration are perceived.

(3) Hair-conditioning effects

"Suppleness of hair", "easiness to arrange hair", "smoothness of hair" and "easiness to comb hair" were organoleptically evaluated by 20 female specialty panelists based upon the following standards:

○: The number of the panelists who evaluated, "Good" was 18 or more.

○: The number of the panelists who evaluated, "Good" was 14 to 17 or more.

△: The number of the panelists who evaluated, "Good" was 8 to 13 or more.

×: The number of the panelists who evaluated, "Good" was 7 or less.

Examples 1 to 2, Comparative examples 1 to 3

Shampoo compositions with the composition shown in Table 1 were prepared using a conventional method, and the efficacies of each essential component were studied, and the results are shown in Table 1.

Table 1

	Composition (wt %)				
	Example		Comparative example		
	1	2	1	2	3
Polyoxyethylene lauryl ether sulfate (3 E.O.)	12.0	12.0	12.0	12.0	12.0
Bis (stearyl-N-hydroxyethyl imidazoline) chloroacetic acid complex	1.5	1.5	1.5	1.5	1.5
Cetyl alcohol			2.0		
Stearyl alcohol	0.5	0.5		2.0	
Behenyl alcohol	0.9	1.5			2.0
Polypeptide	*1 3.0	*2 8.0	*2 8.0	*2 2.0	*2 3.0
Purified water	Balance	Balance	Balance	Balance	Balance
Stearyl alcohol/ behenyl alcohol (weight ratio)	1/1.5	1/3			
Pearl luster	○	○	△	△	○
Stability at high temperature	○	○	×	×	×
Stability at high temperature	○	○	×	×	×
Suppleness	◎	◎	△	△	△
Easiness to arrange hair	◎	◎	△	○	○
Smoothness	◎	◎	△	△	△
Easiness to comb hair	◎	◎	△	△	△

Note) *1 ... Average molecular weight: 200, *2 ... 1,000

Examples 3 to 4, Comparative examples 4 to 7

Shampoo compositions with the composition shown in Table 2 were prepared using a conventional method, and the efficacies of each essential component were studied, and the results are shown in Table 2.

Table 2

	Composition (wt %)					
	Example		Comparative example			
	8	4	4	5	6	7
Lauryl sulfate tri-ethanol amine	15.0	15.0	15.0	15.0	15.0	15.0
Lauryl imidazolinium betaine	8.0	3.0	8.0	3.0	3.0	3.0
Bis (myristyl-N-hydroxyethyl imidazoline) chloroacetic acid complex		1.0	1.0	1.0	1.0	1.0
Bis (behenyl-N-hydroxyethyl imidazoline) chloroacetic acid complex	2.0	1.5	1.0	1.0	1.0	1.0
Cetyl alcohol			1.0	1.0		
Stearyl alcohol	1.0	0.6	2.0		1.0	0.6
Behenyl alcohol	1.8	2.7		2.0	1.0	8.0
Polypeptide	※3 7.0	※2 10.0	※4 7.0	※2 7.0	※3 7.0	※3 7.0
Purified water	Balance	Balance	Balance	Balance	Balance	Balance
Stearyl alcohol/ behenyl alcohol (weight ratio)	1/1.8	1/4.5			1/1	1/6
Pearl luster	○	○	△	△	○	○
Stability at high temperature	○	○	×	×	×	×
Stability at high temperature	○	○	×	×	×	×
Suppleness	◎	◎	△	△	△	△
Easiness to arrange hair	◎	◎	△	△	△	△
Smoothness	◎	◎	△	△	△	△
Easiness to comb hair	◎	◎	△	△	△	△

Note) ※3 ... Average molecular weight: 3,000, ※4 ... 5,000

Examples 5 to 6, Comparative examples 8 to 10

Shampoo compositions with the composition shown in Table 3 were prepared using a conventional method, and the efficacies of each essential component were studied, and the results are shown in Table 3.

Table 3

	Composition (wt %)						
	Example				Comparative example		
	5	6	7	8	8	9	10
Lauryl sulfate tri-ethanol amine	15.0	15.0	—		15.0	15.0	15.0
Coconut oil fatty acid diethanol amide	8.0	8.0	—	3.0	8.0	8.0	8.0
Coconut oil fatty acid amide propyl dimethyl amino betaine acetate	2.0	2.0	15.0	15.0	2.0	2.0	2.0
Bis (lauryl-N-hydroxyethyl imidazoline) chloroacetic acid complex		1.5	1.5	1.5	1.0	1.5	1.5
Bis (palmityl-N-hydroxyethyl imidazoline) chloroacetic acid complex	1.5	1.5	—	—	1.0	1.5	1.5
Stearyl alcohol	0.8	1.5	0.8	0.8	0.8	1.5	1.0
Behenyl alcohol	2.0	2.4	2.0	2.0	2.0	2.4	2.0
Polypeptide	^{#4} 1.0	^{#1} 12.0	^{#2} 8.0	^{#2} 8.0		^{#4} 0.5	^{#2} 15.0
Purified water	Balance	Balance	Balance	Balance	Balance	Balance	Balance
Stearyl alcohol/ behenyl alcohol (weight ratio)	1/2.5	1/1.6	1/2.5	1/2.5	1/2.5	1/1.6	1/2
Pearl luster	○	○	○	○	○	○	○
Stability at high temperature	○	○	○	○	×	×	×
Stability at high temperature	○	○	○	○	×	×	×
Suppleness	◎	◎	◎	◎	○	○	○
Easiness to arrange hair	◎	◎	◎	◎	△	○	○
Smoothness	◎	◎	◎	◎	△	△	○
Easiness to comb hair	◎	◎	◎	◎	△	○	○

CHARACTERISTICS

As it is obvious from Examples 1 to 8, the shampoo compositions of the present invention all show excellent performance.

In the meantime, when the higher alcohol, which is an essential component, is (1) single use of cetyl alcohol, stearyl alcohol and behenyl alcohol, or (2) combined use with two types, such as cetyl alcohol and stearyl alcohol, or cetyl alcohol and behenyl alcohol (Comparative Examples 1 to 5), (3) when the compounding weight ratio of stearyl alcohol to behenyl alcohol is out of range provided in the present invention (Comparative Examples 6 to 7), or (4) when the composition quantity of polypeptide, which is

an essential component, is out of the range provided in the present invention (Comparative Examples 8 to 10), all show poor performance, and the objective of the present invention cannot be accomplished.

EFFICACY OF THE INVENTION

As described above, it is clear that the present invention provides a useful shampoo composition excelling in the pearl luster, storage stability, and hair-conditioning effects.